



HEALTH RISK ASSESSMENT GUIDELINES

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Health Risk Assessment Guidelines For the Antelope Valley Air Pollution Control District

I. INTRODUCTION

A. Background

The Air Toxics "Hot Spots" Information and Assessment Act of 1987 (Health and Safety Code §§ 44300-44384) was adopted by the California Legislature and signed by the Governor in response to public concern about the release of toxic chemicals to the ambient air. Prior to enactment of the Air Toxics "Hot Spots" Act, little information was available to assess the types, quantities, and health impacts of toxic chemicals routinely released to the ambient air in California. The Air Toxics "Hot Spots" Act addresses only routine or predictable releases and not releases due to unforeseen or catastrophic events.

The Air Toxics "Hot Spots" Act requires facility owners to produce and submit to the Antelope Valley Air Pollution Control District (District) a comprehensive inventory of routine releases of toxic chemicals to the ambient air. Using the content of this inventory the District determines a prioritization score for the facility. The Air Toxics "Hot Spots" Act requires facilities, which are categorized as "High Priority" Facilities based upon their prioritization score to prepare and submit Health Risk Assessments (HRA), which estimate the impact of routine air toxics releases. District Rule 1402 defines "High Priority" Facilities as those, which have a prioritization, score for cancer, acute non-cancer or chronic non-cancer health effects of greater than or equal to ten (10).

B. Purpose

This guidance document establishes a uniform method for preparing and submitting HRAs, which comply with the provisions of the Air Toxic "Hot Spots" Act.

II. HEALTH RISK ASSESSMENT PLANS

HRA Plans shall be submitted pursuant to the time lines set for in District Rule 1402. HRA Plans should conform to the "Air Toxics "Hot Spots" Program Risk Assessment Guidelines (CAPCOA, 1993) until such time as the Office of Environmental Health Hazard Assessment (OEHHA) issues its final regulations adopting risk assessment guidelines for the Air Toxics "Hot Spots" Programs. All HRA Plans must use the most recently approved OEHHA Unit Risk Factor & Reference Exposure Values.

Copies of the CAPCOA *Air Toxics "Hot Spots" Program Risk Assessment Guidelines* may be downloaded from www.arb.ca.gov/ab2588/riskassess.htm. For more information on the pending OEHHA guidelines see www.oehha.ca.gov/air/hot_spots/index.html.

A. HRA Plan Requirements

HRA Plans should be prepared as a numbered list of responses to or acknowledgements of the following requirements.

1. Screening Assessment

The owner or operator of a facility required to submit a HRA may opt to perform a screening assessment. Facilities which choose this option should follow the procedures found in the CAPCOA *Air Toxics "Hot Spots" Program Risk Assessment Guidelines*. A full HRA will be required if the screening assessment shows that any one of the following thresholds will be exceeded:

<u>Parameter</u>	<u>Threshold Value</u>
Maximum individual lifetime cancer risk.	10^{-6}
Maximum individual cancer risk in any one year.	1/70 th of lifetime risk
Population cancer burden, acute or chronic hazard index	0.1

2. Dispersion Models

For screening assessments, PTPLU or SCREEN may be used. For formal assessments, ISC-ST must be used to predict ambient concentrations at all receptor locations at elevations lower than the point of release. Complex terrain models may be used to predict concentrations at receptor locations at elevations greater than the point of release. No receptors should be considered as having an elevation below the base elevation of the source.

The HRA Plan must identify the model or models that will be used in the assessment, as well as their source and version number. If any model other than ISC-ST is to be used, the plan should contain an explanation of why the model is appropriate.

If ISC-ST is used, the following modeling options should be chosen:

- . rural dispersion coefficients in rural areas
- . McElroy-Pooler dispersion coefficients in urban areas
- . default wind profile exponent values
- . default vertical potential temperature gradient values
- . Stack tip/building downwash
- . gradual plume rise
- . calm wind processing off
- . regulatory default setting off

Any deviation from these assumptions should be identified and justified in the HRA Plan.

If a model other than ISC-ST is chosen, the plan must identify all assumptions and model options that will be used.

3. Meteorology

All formal HRAs must be conducted with at least two full years of meteorological data. Surface meteorological data can be obtained from the District by contacting:

Mr. Bob Ramirez
Mojave Desert AQMD
14306 Park Ave.
Victorville, CA 92392-2310
(760) 245-1661

Upper air data can be obtained from the National Weather Service's National Climatic Data Center.

National Climatic Data Center
Information Services Division
Federal Building
Asheville, NC 28801
Telephone: (704)259-0871
Answering Machine: (704) 259-0682
FAX: (704) 259-0876

The HRA Plan must identify the source, location, and time period of both the surface and upper air meteorological data to be used in the assessment.

If data other than those provided by the District or the National Climatic Data Center are to be used, the plan must demonstrate that the data meet quality control and quality assurance requirements and be approved by the APCO prior to use.

4. Deposition

Particle deposition must be predicted using the approved procedures and values presented in CAPCOA *Air Toxics "Hot Spots" Program Risk Assessment Guidelines*. If source-specific deposition rates are to be used, the health risk assessment plan must describe the methods and data that will be used to calculate alternate deposition rates. The deposition algorithm in ISC-ST should not be used.

5. Emission Sources

Emission sources may be represented in dispersion models as stacks, areas, volumes, or lines. In some situations, it may be appropriate to group several emission sources together and model them as one source. For example, several fugitive emission points could be aggregated and modeled as a single area source.

The HRA Plan must describe how each source included in the Toxic Emission Inventory Report will be represented in the HRA.

Note that area sources must be represented in the models as squares. For volume and line sources, the initial lateral and vertical dimensions should be determined in accordance with the suggested procedures described in the ISC user's manual.

6. Facility Plot Plan

The health risk assessment plan must include a plot plan of the facility that is drawn to scale and that clearly identifies the following:

- . the locations of all sources reported in the AB2588 emission inventory report, identified by their stack identification numbers
- . the locations and heights of all buildings or structures
- . the location of the facility boundary
- . the type of land use bordering the facility in each direction (e.g., residential, industrial, commercial, agricultural, or open space)

7. Emission Rates

The HRA should be prepared using the emission rates contained in the Toxic Emission Inventory Report. Emissions that were reported as being less than the detection limit of a source test should be assumed to be equal to one half the detection limit. Any deviation from the reported values must be identified and justified in the health risk assessment plan and must be documented in a District approved revised Toxic Emission Inventory Report. Emissions may be varied over time to account for operating schedules. If emissions are to be varied over time, the scaling factors used must be described and justified in the plan.

8. Health Effects Factors

The health risk assessment must use the most recently approved unit risk factors, potency values, and reference exposure levels as determined and published by OEHA. No deviation will be allowed for those items which are included in the Toxic Emission Inventory Report but which do not have unit risk values, potency values or reference exposure levels no further analysis is necessary.

Respirable particles will be defined as particles less than 10 microns in diameter.

9. Maximally Exposed Individual

The health risk assessment must identify the location of the maximally exposed individual within 100 meters of its actual location. The health risk assessment plan

must describe how the maximum will be located with the required degree of accuracy.

10. Population Cancer Burden

The HRA must estimate the number of excess cancer cases expected in the population residing or working within the zone of impact. This is known as the population cancer burden. The District defines the zone of impact as the area exposed to an individual lifetime cancer risk of 10^{-6} (or one in one million) or an acute or chronic hazard index of 0.1, whichever is greater.

The HRA Plan must describe how the zone of impact will be identified. The plan must also identify the methods, data, and assumptions to be used in estimating the population cancer burden. Facilities should insure that all assumptions used in this analysis do not underestimate the population cancer burden.

Maps showing the boundaries of the areas used in the census are available from:

San Bernardino County Planning Department
Data Systems Team
385 No. Arrowhead Avenue, 3rd Floor
San Bernardino, CA 92415-0182
Telephone: (909) 387-4283

For some facilities, the surrounding census areas will be too large to provide a meaningful level of resolution. If the census areas do provide a level of resolution adequate for this analysis, however, the census data should be used.

11. Sensitive Receptors

The HRA must estimate the individual lifetime cancer risk at all sensitive receptors. Sensitive receptors include the following:

- . schools (public and private)
- . day care centers
- . health care facilities
- . nursing homes

The HRA Plan must describe the methods that will be used to identify these sensitive receptor locations.

12. Area Map

The HRA Plan must include a map of the area surrounding the facility. The map must clearly indicate the facility boundaries and the location of the nearest occupational and residential receptors. It must indicate the location of any census areas or population centroids that will be used in the estimation of the population

cancer burden. If available, the map should indicate the extent of the zone of impact and the location of sensitive receptors.

13. Multipathway Analysis

A multipathway analysis must be included in the HRA for all applicable substances. All multipathway analyses must consider exposure via inhalation, soil ingestion, dermal absorption, and mother's milk. This analysis must be conducted using the procedures and default values described in CAPCOA *Air Toxics "Hot Spots" Program Risk Assessment Guidelines*. Any deviation from these procedures or values must be identified and justified in the HRA Plan.

The HRA Plan should also identify the assumptions to be used in estimating the risk due to exposure via ingestion of home-grown food; ingestion of local fish, poultry, or livestock; and ingestion of surface water or groundwater. If these exposure pathways will be not be addressed in the health risk assessment, the health risk assessment plan must provide justification for this omission.

III. HEALTH RISK ASSESSMENT REPORT

The health risk assessment report must be prepared in accordance with CAPCOA *Air Toxics "Hot Spots" Program Risk Assessment Guidelines* and must include all of the information that is necessary to duplicate the results. All suggested tables and figures should be included in the report. The summary tables must include a listing of each pollutant's contribution to the maximum individual lifetime cancer risk, the population cancer burden, the acute inhalation hazard index, and the chronic hazard index for each toxicological endpoint considered.

Risk assessments using alternative assumptions, uncertainty analyses, and risk management studies may be included in the health risk assessment report as appendices. The results of these studies may be described in the report's executive summary but must not appear in the main body of the report.

Three copies of the HRA Report should be submitted to the District pursuant to the time lines set forth in Rule 1402. Along with the report, all facilities must submit copies of all dispersion model input files used in the assessment.

IV. SUBMISSION OF HRA PLANS AND REPORTS

The HRA Plans and Reports should be submitted to:

Bret Banks
Operations Manager
Antelope Valley Air Pollution Control District
43301 Division Street, Suite 206
Lancaster, CA 93535-4649